

## WHAT IS CLAIMED IS:

1. A network communication system in which a source node sends identical information to a plurality of destination nodes, comprising:

a relay node having a star relay node device for receiving the identical information from the source node and sending the identical information to the plurality of destination nodes; and

a plurality of predetermined communication paths linking the relay node to the destination nodes in a star topology centered on the relay node, the identical information being sent through said predetermined communication paths to the destination nodes.

2. The network communication system of claim 1, wherein the star relay node device at the relay node includes a virtual address notification unit for notifying the source node of a virtual address corresponding to said plurality of destination nodes, and the source node sends the identical information to the plurality of destination nodes by sending the identical information to the relay node and specifying the virtual address as a destination address.

3. The network communication system of claim 2, comprising a plurality of network nodes coupled to the relay node, each network node among said network nodes having a node device making said network node operable as said source node and, at different times, to operate as one of said destination nodes.

4. The network communication system of claim 3, wherein the node device at said network node includes:

a request unit for generating a request to send the

identical information to the plurality of destination nodes;  
a unicast processing unit for sending said request and said identical information to the relay node;  
a receiving unit for receiving said identical information and said virtual address; and  
a virtual address storage unit for storing said virtual address.

5. The network communication system of claim 1, wherein the identical information includes a time-to-live parameter, and the star relay node device includes a time-to-live parameter setting unit for assigning a minimum value to the time-to-live parameter.

6. The network communication system of claim 1, wherein the identical information is accompanied by address information, and each of the destination nodes has a node device comprising:

a filtering unit for comparing the address information accompanying the identical information with predetermined address information; and

a multicast processing unit for receiving the identical information if the accompanying address information matches the predetermined address, and discarding the identical information if the accompanying address information fails to match the predetermined address.

7. The network communication system of claim 1, wherein the star relay node device has an optical wavelength division multiplexing unit for inserting the identical information received from the source node into information sent by wavelength division multiplexing to the destination nodes.

8. The network communication system of claim 7, wherein the optical wavelength division multiplexing unit uses a single wavelength to send the identical information to all of the destination nodes.
9. The network communication system of claim 1, wherein the star relay node device has a copying unit for copying the identical information for transmission to the destination nodes.
10. The network communication system of claim 1, wherein the source node has a node device including a source routing transmitting unit for defining said predetermined paths, and the star relay node device includes a source-routed relay processing unit for sending the identical information on the predetermined paths defined by the source routing transmitting unit at the source node.
11. A method of sending identical information from a source node to a plurality of destination nodes in a communication network, comprising the steps of:
- (a) sending the identical information from the source node to a predetermined relay node; and
  - (b) sending the identical information from the predetermined relay node to the destination nodes over predetermined communication paths connecting the destination nodes to the predetermined relay node in a star topology.
12. The method of claim 11, wherein the plurality of destination nodes are designated by a single virtual address, and the source node addresses the identical information to the virtual address.
13. The method of claim 12, further comprising the step of

sending the virtual address from the predetermined relay node to the source node for subsequent use by the source node in said step (a).

14. The method of claim 11, wherein the communication network includes a plurality of network nodes, any one of which can operate both as said source node and, at different times, as one of said destination nodes.

15. The method of claim 11, wherein the identical information is accompanied by address information, further comprising the steps of:

(c) comparing the address information included in the identical information with predetermined address information at at least one of the destination nodes;

(d) transferring the identical information from said one of the destination nodes to equipment connected to said one of the destination nodes by a communication path, if the address information accompanying the identical information matches the predetermined address information; and

(e) discarding the identical information at said one of the destination nodes if the address information accompanying the identical information fails to match the predetermined address information.

16. The method of claim 11, further comprising the step of setting a time to live of the identical information to a minimum value at the relay node.

17. The method of claim 11, wherein said step (b) is carried out by wavelength division multiplexing.

18. The method of claim 17, wherein said identical information is sent to all of said destination nodes on

identical wavelengths.